

LCA Commons Submission Guidelines

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USDA-NATIONAL AGRICULTURAL LIBRARY

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Introduction

Thank you for your interest in submitting your data to the LCA Commons. The LCA Commons is a single database that hosts LCA unit processes, and is open to all who are interested in using or contributing agriculture-related LCA data. Regarding data management, a single database with data from multiple sources provides advantages while creating challenges. One advantage of this approach is to provide LCA practitioners with the opportunity to choose many unit processes from a range of sources that represent a particular activity, across a range of goals and/or scopes, and allow these unit processes to “connect” to a product system within a modeling software tool. Challenges to this approach include collecting and presenting sufficient metadata to differentiate between unit processes of similar scope, intended applications, and limitations, as well as ensuring that flows are connected to appropriate unit processes and impact methods within the LCA model. Data connectivity/interoperability is largely dependent on the structure of unit process metadata (name, category, subcategory, units, and location).

The guidance and requirements in this document are intended do the following:

1. To assist the data provider in preparing sufficient metadata to accurately describe unit processes, and
2. To assist the staff at the LCA Commons in ensuring that the flows to and from the unit process can connect to their providing/receiving LCA elements, either other unit processes or impact methods.

Thank you again for your interest in contributing your data to the LCA Commons. Prior to submitting data, please review the [Data Use Disclaimer Agreement](#), the [Data Contributor’s Content License Agreement](#), and the [Placing Your Data in the Public Domain](#) sections of this document. If you have any questions, concerns, or recommendations, please [contact us through our online web form](#).

Placing Your Data in the Public Domain

To support increased access to and sharing of scholarly resources, as well as to promote novel and innovative uses of LCA data, USDA-NAL is requiring that all datasets submitted to the LCA Commons be placed in the public domain under the terms of the [Creative Commons Zero, Public Domain Dedication License](#) (CC0 1.0 Universal (CC0 1.0)). By placing your datasets in the public domain, you are, according to the CC0 1.0 license, removing “all of [your] rights to the work worldwide under copyright law, including all related and neighboring rights, to the extent allowed by law.”

By relinquishing these rights, USDA-NAL hopes that users’ contributions will result in a growing commons of freely available scientific research that can be built upon, re-purposed, and widely disseminated without fear of legal infringement. According to Malloy (2011) of the Open Knowledge Foundation, “The more data is made openly available in a useful manner, the greater the level of transparency and reproducibility and hence the more efficient the scientific process becomes, to the benefit of society.”¹ Furthermore, making data openly available has been associated with increased citation rates^{2 3}, whereas restricted data availability has been shown to negatively affect research activities^{4 5}.

Please review the [legal code](#) of the CC0 1.0 Universal license prior to submitting your datasets, as well as the [Data Use Disclaimer Agreement](#) and the [Data Contributor’s Content License Agreement](#).

Dataset Citations

It should be made clear, however, that although the *legal* requirement to cite datasets is removed under the terms of the CC0 1.0 Universal license, individuals who use these datasets are not absolved from institutional and scholarly norms requiring dataset citation. Individuals who use LCA Commons datasets are **strongly encouraged** to cite these datasets to comply with institutional and scholarly norms, as well as to acknowledge and credit the work of data creators.

¹ Molloy JC (2011) The Open Knowledge Foundation: Open Data Means Better Science. PLoS Biol 9(12): e1001195. doi:10.1371/journal.pbio.1001195

² Piwowar HA, Day RS, Fridsma DB (2007) Sharing Detailed Research Data Is Associated with Increased Citation Rate. PLoS ONE 2(3): e308. doi:10.1371/journal.pone.0000308

³ Eysenbach G (2006) Citation Advantage of Open Access Articles. PLoS Biol 4(5): e157. doi:10.1371/journal.pbio.0040157

⁴ Vogeli C, Yucel R, Bendavid E, Jones L, Anderson M, et al. (2006) Data withholding and the next generation of scientists: results of a national survey. Academic Medicine 81: 28–136. doi:10.1097/00001888-200602000-00007

⁵ Molloy JC (2011) The Open Knowledge Foundation: Open Data Means Better Science. PLoS Biol 9(12): e1001195. doi:10.1371/journal.pbio.1001195

Data Requirements

The USDA LCA Commons will accept **unallocated unit processes** related to agricultural production. Unit processes may be submitted as single gate-to-gate processes or related processes grouped as product or intermediate product systems.

Data Reliability and Reproducibility: Flow data within the unit process(s) must be based on measurements using a specified and standardized measurement method OR estimated using methods and data described in specified archival or other consistently publically available sources. Further, data should represent a novel contribution to the LCA community and be non-proprietary. Unit processes that represent proxy upstream processes should not be submitted.

Nomenclature: Upstream exchanges that are not represented by a unit process dataset being submitted that meets the above requirements, **AND** are not represented in an external database or software program should be labeled “**CUTOFF**” in accordance with the guidelines described below. When proxy technosphere flows belong to a commercial database or software program, they must use exactly the same **name, category, subcategory, location code,** and **units** that are used in the external database or software program.

Formatting Data for the LCA Commons

The LCA Commons is structured upon the [openLCA 1.4](#) database schema. Therefore, unit process datasets submitted to the LCA Commons must be edited in openLCA to ensure all metadata elements persist through submission¹. Once you edit your unit processes in openLCA, export and submit them in the openLCA [ILCD](#) (International reference Life Cycle Data System) XML format. openLCA can be downloaded free of charge at [openLCA.org](#).

[EcoSpold \(v1\)](#) and ILCD submissions generated by SimaPro, GaBi, ecoEditor, the ILCD editor, or any other editor may not carry the required metadata fields and datasets may be returned to you. Please import and edit these datasets into openLCA and export files in the openLCA ILCD format for submission. Inspecting your data in openLCA prior to submission is an opportunity to preview how your data will appear in the LCA Commons.

Nomenclature

Technosphere flows:

Name all **original** technosphere flows (product and intermediate flows) that you submit as unit processes to the LCA Commons according to the ILCD naming convention (see Metadata Guidelines below for element definitions):

base name; treatment, routes, standards; production type, location type; quantitative flow properties

When **original** technosphere flows are specified in submitted datasets, but the associated “upstream” datasets are not simultaneously submitted, the flow name must begin with the word “CUTOFF” and otherwise follow the ILCD structure, for example:

CUTOFF prepare soil; conventional till; corn; <15% residue

When technosphere flows belong to an external software/database, they must use **EXACTLY** the same **name, category, subcategory, location code,** and **units** that are used in the external software/database. This assists LCA Commons staff in mapping flows in your unit process to those in the external dataset.

Elementary Flows:

Elementary flow names must correspond directly to the impact method used in the Life Cycle Impact Analysis (LCIA). Again, this assures users that your dataset can connect your elementary flows to the associated LCIA method. The submission form asks you to select the impact method(s) corresponding to your elementary flows from the list included in openLCA. If an LCIA method other than those listed was used, please select “other”, and enter the name of the method in the submission application’s comment field. If data being submitted have not been used in a Life Cycle Impact Assessment, please use ILCD flow names.

¹ This requirement exists to enable data transfer and does not imply an official endorsement of openLCA as a life cycle modeling tool

Units

openLCA includes a set of reference unit groups and units. To ensure data is properly imported into the LCA Commons, the units included in the openLCA reference unit groups must be used. If the openLCA reference units are not appropriate (or when they do not match corresponding flows in external databases), [contact the LCA Commons staff](#) to have a unit added to the list.

Categories

The LCA Commons uses [ISIC rev. 4](#) (International Standard Industrial Classification of All Economic Activities) codes to categorize technosphere flows in openLCA, and openLCA reference data categories for flows to and from the environment. To ensure consistent categorization and assist in data management and discovery, use this categorization scheme for **original** flows. To ensure data connectivity, flows corresponding to unit processes in other databases should use the categorization scheme from those databases.

When using openLCA, categorize all **original** technosphere flows using the ISIC rev 4. codes in the following manner:

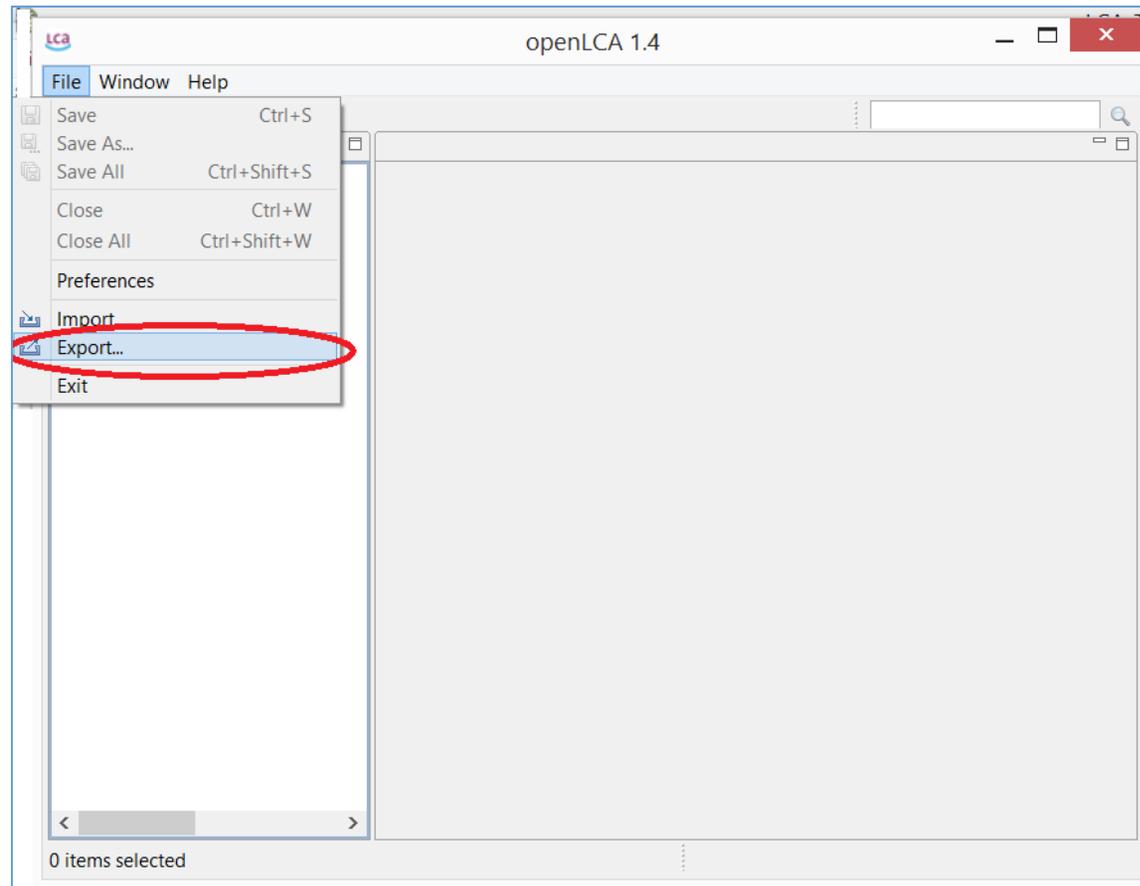
- Level 1 category: the class name corresponding with the top level ISIC code.
 - **Example:** *Agriculture, forestry and fishing*
- Level 2 category: the 4-digit code and name, prefixed with the term “ISIC”.
 - **Example:** *ISIC 0112: Growing of rice*

Categorize all **original** flows to and from the environment using the EcoSpold (v1) categorization scheme.

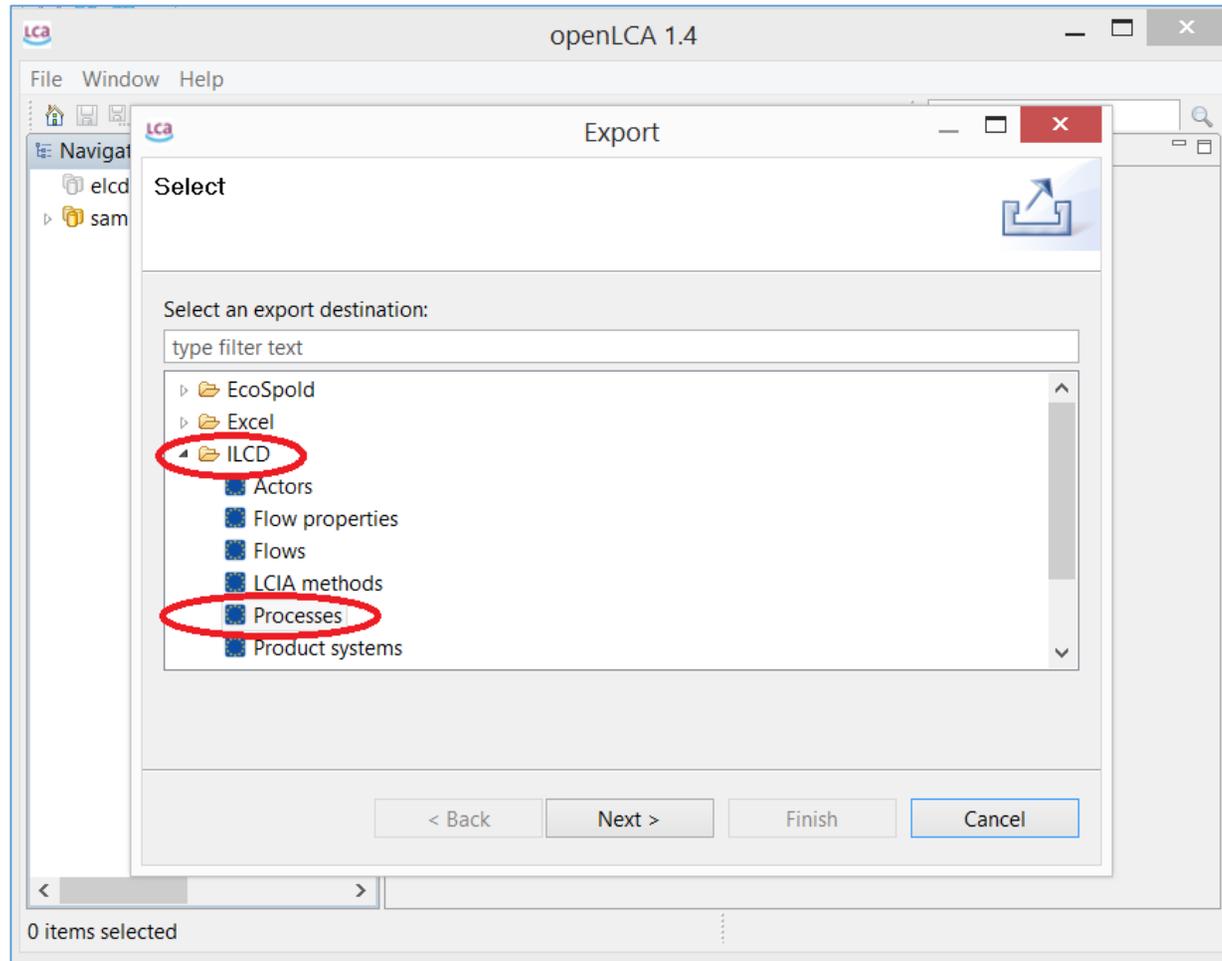
Dataset Submission Instructions

To submit datasets to the LCA Commons for review, you must first export ILCD-formatted datasets from openLCA. The instructions below show how to export datasets from openLCA framework 1.4 to the LCA Commons Submission Portal.

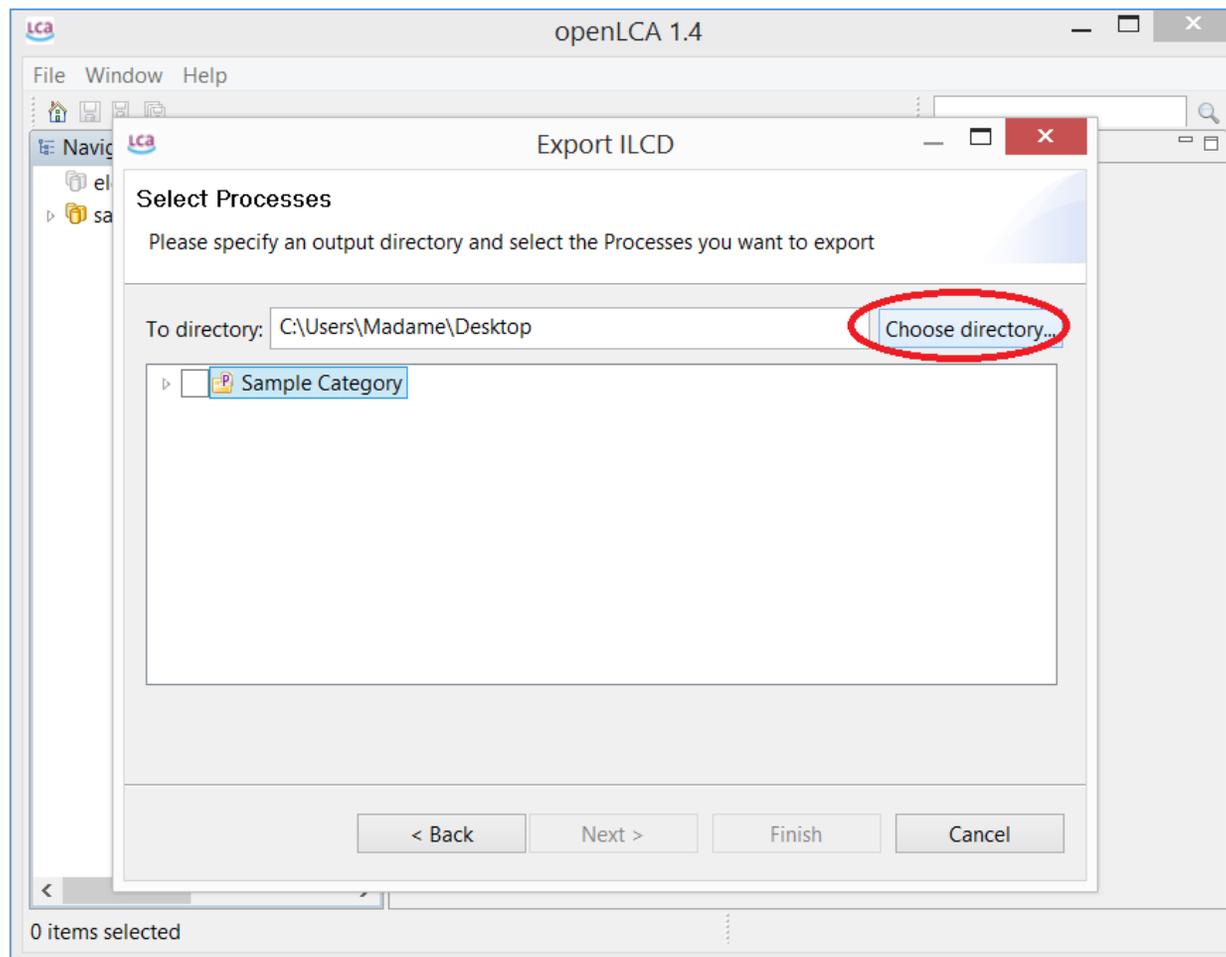
- 1) To export one or more unit or system processes from openLCA, click on the “File” tab in the openLCA editor and select “Export”.



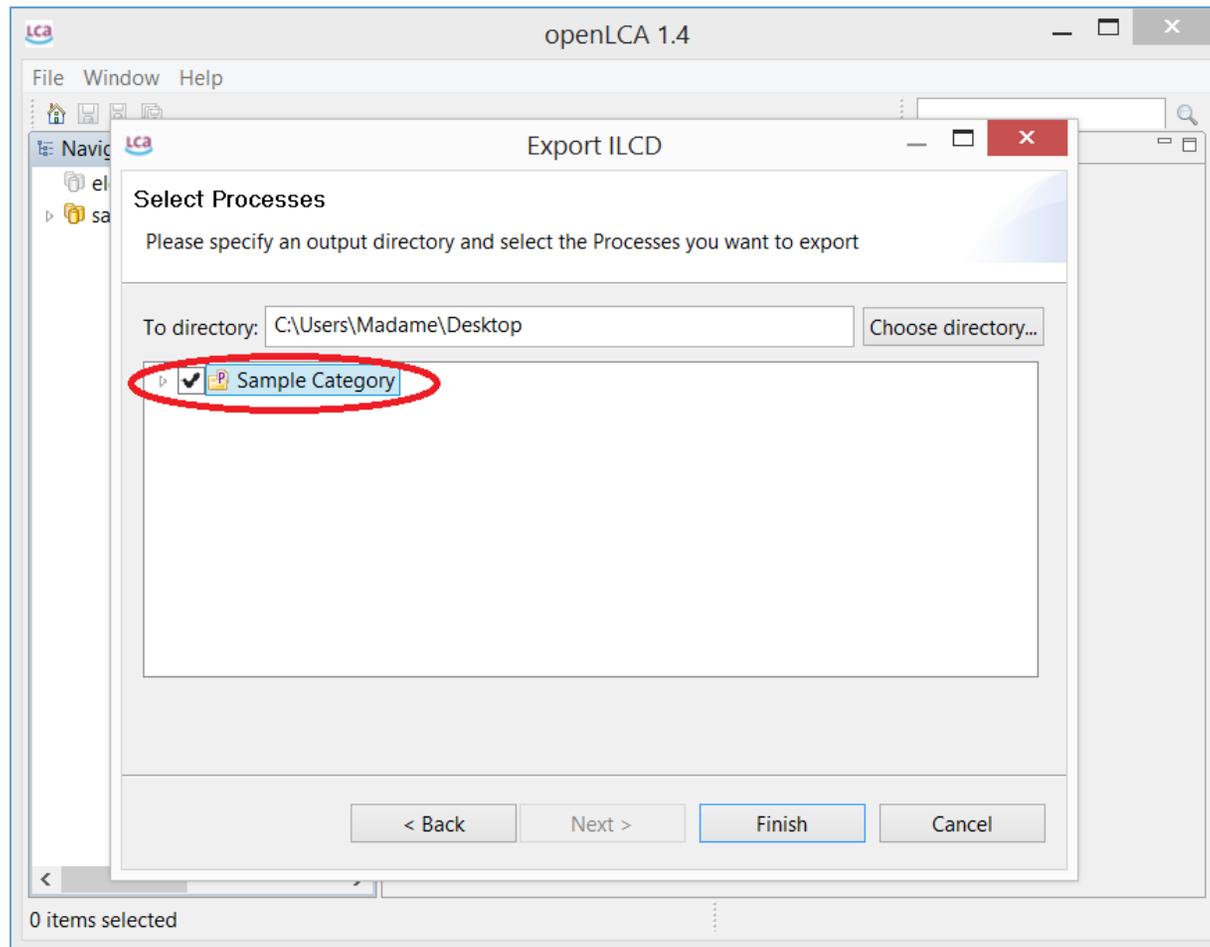
- 2) Click on the “ILCD” folder in the directory on the screen, then click on the “Processes” folder. Click “Next” when you are finished.



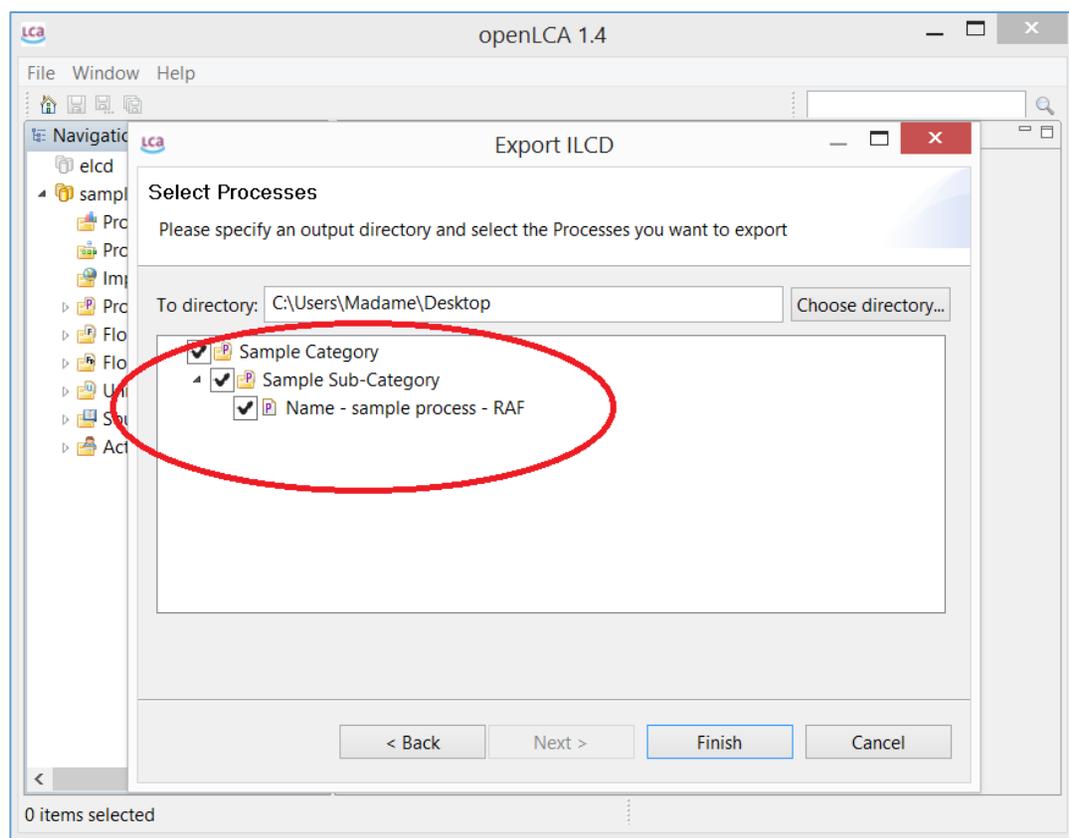
- 3) When the “Select processes” screen appears, select the file directory in which you wish to store your datasets by clicking the “Choose directory” button.



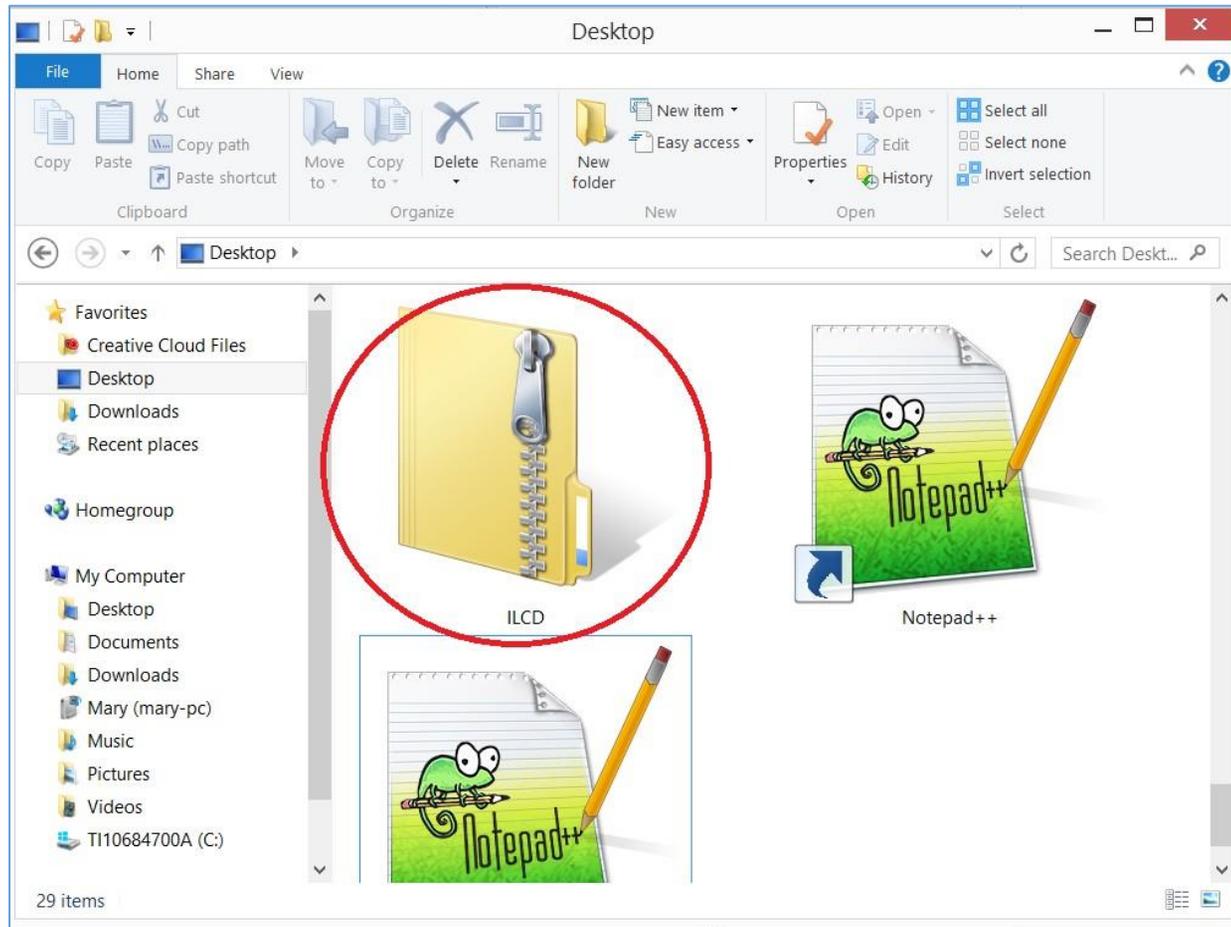
- 4) After selecting the file directory in which to store your datasets, click on the box to the left of the folder category that is storing your data. In this example, the folder category is “Sample Category.”



- 5) To select which process datasets you want to export, click the arrow to the left of the checkbox by the folder name, which in this case is “Sample Category.” If you wish to export all processes from this folder, click the “Finish” button and the export process will begin.
 - a. You may also export processes from sub-folders in the main folder. For this example, we have a sub-folder called “Sample sub-category.” If you wish to export all processes from the “Sample sub-category” folder, or selected processes from the “Sample sub-category” folder, click on the checkbox to the left of the folder or process you wish to export, then click the “Finish” button.



- 6) Check the file storage location you selected previously to ensure that the file has been successfully exported. The exported file will be a ZIP file, since each process is comprised of multiple datasets (e.g. Process information, Flow information, Actor information, etc.)



- 7) After confirming that your file has been successfully exported from openLCA, visit the [LCA Commons Submission Portal](#), then click on the “Submit a Dataset” page.

USDA United States Department of Agriculture
National Agricultural Library

LCA Digital Commons
Data and Community for Life Cycle Assessment

Editorial Management
Logged in as u.k.leguin.submitter@gmail.com

My Submissions **Submit a Dataset** Submission Guidelines LCI Database Help Log-out

LCA Digital Commons Submission Portal

Welcome to the LCA Digital Commons (LCADC) Submission Portal. You may use this portal to submit datasets to LCADC, receive feedback from peer reviewers, and search the USDA LCI database.

If you wish to submit datasets to LCADC, follow the requirements outlined in the documents below:

- Data Requirements
- Data Formatting and Nomenclature Guidelines
- Metadata Guidelines
- Peer Review

After reviewing these documents, visit the **Submit a Dataset** page. To view your current or previous submissions, visit the **My Submissions** page.

For assistance, please **contact the LCADC staff**.

ver.v2.0Alpha 2014-04-29 [Contact Us](#)

- 8) In the “Upload Data” field of the “Submit a Dataset” page, attach the ZIP file containing the XML-formatted datasets exported from openLCA (see next page for screenshot).

NOTE: The ZIP file **MUST** be directly exported from openLCA to be successfully imported into the LCA Commons Submission Portal. Do not manually create a ZIP file containing multiple datasets – this will increase the likelihood of datasets being imported without complete information, which can result in errors.

The screenshot displays a web form for submitting a dataset. It is divided into two main sections. The top section, titled "Quality Indicators", contains seven rows, each with a label and a dropdown menu. The labels are: "* Reliability and Reproducibility", "Flow Data Completeness", "Technological Coverage", "Geographical coverage", "Temporal Coverage", "Precision", and "Uncertainty". Each dropdown menu currently shows "Select One". The bottom section contains three rows: "* Upload Data", "Supporting documentation (optional)", and "Recommended reviewers and additional comments". The "Upload Data" label is circled in red. To its right is a file upload field with a "Browse..." button (also circled in red) and the text "No file selected.". The "Supporting documentation (optional)" row has a similar "Browse..." button and "No file selected." text. The "Recommended reviewers and additional comments" row is a large empty text area.

Continued on next page...

The image shows a web application interface with a Windows File Upload dialog box overlaid. The dialog box is titled "File Upload" and shows the "Desktop" location. The "Ica_Datasets" folder is selected and highlighted with a red oval. The "Open" button is also highlighted with a red oval. The web application interface includes several input fields with question marks for help:

- * Descriptive Title ?
- * Mass Balance Estimate ?
- Life Cycle Impact Methods ?
- Quality Indicators**
- * Reliability and Reproducibility ?
- Flow Data Completeness ?
- Technological Coverage ?
- Geographical coverage ?
- Temporal Coverage ?
- Precision ?
- Uncertainty ?
- * Upload Data
- Supporting documentation (optional) ?
- Recommended reviewers and additional comments ?

9) Once you've selected the ZIP file you want to attach, the file name will appear in the "Upload Data" field. After confirming that the correct file has been attached, fill out the rest of the form and submit your datasets.

* Upload Data Ica_Datasets.zip

Supporting documentation (optional) No file selected.

Recommended reviewers and additional comments

Metadata Mappings (Process data sets)

Below is a table showing the correspondences between Process dataset fields in openLCA – USDA LCI (1.4), ILCD 1.1, EcoSpold v1, and ISO 14048:2002.

openLCA – USDA LCI Element Name	ILCD Element/Attribute Name	ISO 14048:2002 Field Name	EcoSpold v1 Element/Attribute Name
Name	Name	Name	Name (referenceFunction)
Base name	Base name		
Treatment, standards, routes	Treatment, standards, routes		
Mix and location types	Mix and location types		
Quantitative product or process properties	Quantitative product or process properties		
Category	Classification	Class	
		Reference to nomenclature (Class)	
	Top category	Name (Class)	category
	Subcategory		subCategory
Version	Data set version	Version number	
Last change			timestamp
Description	General comment on data set	Process description	generalComment
Quantitative Reference	Quantitative reference	Quantitative reference	name (Flow data)
	Type of quantitative reference	Type	
	Reference flow(s)	Name	
	Functional unit, Production period, or Other parameter	Unit	
Start date (mm/dd/yyyy)	Reference year	Start date	startDate
End date (mm/dd/yyyy)	Data set valid until:	End date	endDate
Description (Time)	Time representativeness description	Time span description	text (Timeperiod)
Location	Location	Geographical location	location

openLCA – USDA LCI Element Name	ILCD Element/Attribute Name	ISO 14048:2002 Field Name	EcoSpold v1 Element/Attribute Name
KML			
Description (Geography)	Geographical representativeness description	Area description	text (Geography)
Description (Technology)	Technology description including background system	Technical content and functionality, Operating conditions	text (Technology)
Intended Application	Intended applications	Intended application	generalComment (Reference Function)
Data generator (Actor data set)	Data set generator / modeler (Contact data set)	Data generator	person (Data generator and publication)
Data set owner (Actor data set)	Owner of data set (Contact data set)		person (Data generator and publication)
Data documentor (Actor data set)	Data set documentor (Contact data set)	Data documentor	person (Data generator and publication - Data entry by)
Project	Project		
Publication (Source data set)	Unchanged republication of (Source data set)	Publication	Source text (Source)
Access and Use Restrictions	Access and use restrictions	Access restrictions	accessRestrictedTo
Creation Date	Timestamp (last saved)	Date completed	timestamp
Copyright (Y/N)	Copyright?	Copyright	copyright
LCI Method	LCI method and allocation		allocationMethod (Flow dataset)
Process type	Type of data set	parts of: Modelling principles, Modelling choices, including criteria for excluding elementary flows	type (Dataset Information)

openLCA – USDA LCI Element Name	ILCD Element/Attribute Name	ISO 14048:2002 Field Name	EcoSpold v1 Element/Attribute Name
Data completeness	Data cut-off and completeness principles	parts of: Modelling principles, Modelling choices, including criteria for excluding elementary flows	generalComment (Flow data set)
Data treatment	Data treatment and extrapolations principles	(Adaptation principles), Data treatment	generalComment (Flow data set)
Treatment of missing data to or from the environment			
Treatment of missing intermediate flow data			
Mass balance			
Sampling procedure	Sampling procedure	Sampling procedure	samplingProcedure
Data collection period	Data collection period	Collection date	text (Timeperiod)
Reviewer	Reviewer name and institution	Validator	proofReadingValidator
Other evaluation	Review details	(Procedure), (Result)	otherDetails (Validation)
Sources	Data sources used for this data set (Source data set)	Information sources	Source
Inputs / Outputs	Inputs and Outputs		Exchanges - Input / Output Group
Flow (Flow Data set)	Flow (Flow data set)		Name
Category	Classification		Category
			Subcategory
Flow property	Flow property		
Unit	Reference unit (Flow property data set)		Unit
Amount	Mean amount & Resulting amount		

openLCA – USDA LCI Element Name	ILCD Element/Attribute Name	ISO 14048:2002 Field Name	EcoSpold v1 Element/Attribute Name
Uncertainty	Uncertainty distribution type		Uncertainty type
Default provider			
Pedigree uncertainty			
Parameters	Variable / Parameter	Parameter	
Global/Input/Output Parameters			
Name	Name of variable	Name of variable	
Value	Mean value	Value of variable	
Formula	Formula	Formulae	
Uncertainty	Uncertainty distribution type		
Description	Comments, units, defaults		

Metadata Guidelines

The following guidelines describe how to create metadata for LCA Commons datasets. The listed metadata elements are available in [openLCA 1.4](#), which is the database management system the LCA Commons uses to store its data. The LCA Commons uses openLCA metadata elements to describe LCI data, and ILCD (International Reference Life Cycle Data System) definitions to describe these elements². USDA subject matter experts have also created several custom elements and definitions for the LCA Commons metadata structure.

The LCA Commons metadata elements are divided into the following categories:

- [General Information](#)
- [Administrative Information](#)
- [Modeling and Validation](#)
- [Parameters](#)
- [Flows \(Exchanges\)](#)
- [Actors](#)
- [Sources](#)

The LCA Commons metadata elements are listed in the tables below, along with their definitions, information about whether they are required or optional, element examples, and notes providing further guidance. Please review the documentation below when creating metadata for your datasets.

² This product includes portions of the ILCD Format and/or the ILCD Editor, created by the European Commission's JRC-IES, European Platform on Life Cycle Assessment together with the KIT, IAI. Copyright (C) 2011, European Commission. All Rights Reserved.

General Information

<u>Element</u>	<u>Required/Optional</u>	<u>Repeatable?</u>	<u>Datatype</u>	<u>Definition</u>	<u>Example</u>	<u>Notes</u>
Name	Required	Not repeatable	Free text (String)	General descriptive name of the process and/or its main good(s) or service(s) and/or its level of processing.	CUTOFF prepare soil; conventional till; corn; <15% residue	<p>Include the following four components in your model's Name field. Separate components with semi-colons.</p> <ul style="list-style-type: none"> - Base name - Treatment/standards/routes - Mix type and location type - Quantitative product or process properties
Base name	Required	Not repeatable	Free text (String)	General descriptive name of the product produced.	soybeans	

<p>Treatment, standards, routes</p>	<p>Required</p>	<p>Not repeatable</p>	<p>Free text (String)</p>	<p>Qualitative information about the product produced, specifically: treatment received, standard fulfilled, product quality, use information, production route name, educt name, primary / secondary etc.</p>	<p>conventional till</p>	<p>Separate each treatment, standard, or route by commas.</p>
<p>Mix and location types</p>	<p>Required</p>	<p>Not repeatable</p>	<p>Free text (String)</p>	<p>Specifying information on:</p> <ul style="list-style-type: none"> - Whether the process is a production mix or consumption mix, if applicable, <p>AND</p> <ul style="list-style-type: none"> - A description of the location type of availability 	<p>production mix, at farm</p>	<p>Separate mix and location types by commas.</p> <p>Include only the location type of availability if the process is not a mix.</p>

<p>Quantitative product or process properties</p>	<p>Required, if applicable</p>	<p>Not repeatable</p>	<p>Free text (String)</p>	<p>Further specifying information on the good, service or process in technical term(s): qualifying constituent(s)- content and / or energy- content per unit, etc., as appropriate. Separated by commas.</p>	<p>85%-92% moisture</p>	
<p>Version (“Process” data set)</p>	<p>Do not enter</p>	<p>Not repeatable</p>	<p>Version (XX.XX.XXX)</p>	<p>The data set version number. The first two digits refer to major updates, the second two digits refer to minor revisions and error corrections, and the final three digits are used for automatic and internal version counting during data set development. (ILCD)</p>	<p>01.00.000</p>	<p>Unless discussed with submitters in advance, the data set version number will be generated automatically by openLCA.</p>
<p>Last change</p>	<p>Required</p>	<p>Not repeatable</p>	<p>Timestamp</p>	<p>The date and time when the dataset was last saved. (LCA Commons)</p>	<p>2014-01-22 13:41:44.0</p>	<p>Encoded in ISO 8601 date/time format. If you are creating data in openLCA, this field will be automatically generated.</p>

Category (1st level)	Required	Not repeatable	Enumeration (ISIC Code)	The class name corresponding with the top level ISIC code as described in the 7-digit code and name as described in the <u><i>International Standard Industrial Classification of All Economic Activities, rev. 4.</i></u>	Agriculture, forestry and fishing	Record the class name corresponding to the top level ISIC code (the first name in the hierarchy, noted with a single letter) in the following format: "Class name"
Category (2nd level)	Required	Not repeatable	Enumeration (ISIC Code)	The 4-digit code and name as described in the <u><i>International Standard Industrial Classification of All Economic Activities, rev. 4.</i></u> prefixed with the term: "ISIC ."	ISIC 0112: Growing of rice	Record the 4-digit ISIC code and its corresponding class name (the final name in the hierarchy) in the following format: "ISIC XXXX: Class name"

<p>Description</p>	<p>Required</p>	<p>Not repeatable</p>	<p>Free text (String)</p>	<p>A description of the process, its technical scope (e.g. gate-to-gate or cradle- to-grave), and any aggregation. Describe the technology that was used, its operating conditions, and the process's general temporal and geographic representativeness.</p>	<p>“This unit process/ gate-to-gate data set represents the production of 1 kg corn. Co-production with silage and residue over multiple years is captured in the referenced intermediate flow datasets. Accounting multiple years of crop production is intended to capture the variability (e.g. yield, irrigation, and nutrient applications) that comes from differences in weather and operations.”</p>	
<p>Quantitative Reference</p>	<p>Required</p>	<p>Not repeatable</p>	<p>Reference to “Flow” data set</p>	<p>Reference to which the size of the inputs and outputs in the process relate. This can be the functional unit (e.g. 1 ton · mi) or reference flow (e.g. 1 kg soybeans, with residue [unallocated]), and be used in another process.</p>	<p>soybeans, at harvest, production mix at farm, 85%-92% moisture (See Name field)</p>	<p>The name of the quantitative reference flow must be identical to the name of the unit process it is referencing.</p> <p>In ILCD and openLCA, quantitative reference information must be entered in the Flow record and linked to the Process record.</p>

Start date	Required	Not repeatable	Date (dd/mm/yyyy)	Start date for the time period that the data represent.	01/01/2008	<p>If you are submitting datasets in ILCD format, encode dates according to ISO 8601, e.g. "YYYY-MM-DD".</p> <p>If you are creating datasets in openLCA, encode dates in the following format: "dd/mm/yyyy"</p>
End date	Required	Not repeatable	Date (dd/mm/yyyy)	End date for the time period that the data represent	12/31/2008	See "Notes" field for "Start date"
Temporal representativeness comment	Required	Not repeatable	Free text (String)	Description of the data's temporal characteristics, including the time period they refer to and for which they are valid, and any temporal aggregation and incongruence of supporting data.	"On farm milk production data were gathered using producer survey instruments issued through producer co-operatives between January 2009 and June 2009. Secondary data were collected from a variety of sources and range of years (1998-2009)."	
Location	Required	Not repeatable	Enumeration (ISO 3166-2 code)	If the data represent a U.S. state, use the appropriate ISO 3166-2 code indicating the data set's geographic location (US state).	US-CA	If you are using custom locations, describe these locations in the geographical representativeness comment.

KML	Optional	Not repeatable	Bounding coordinates derived from openLCA KML file (external KML files cannot be submitted)	Keyhole Markup Language file, which allows users to create a coordinate bounding box or polygon indicating the geographic area their data represent.	Polygon [-77.92, 39.55... -77.92, 39.55]	
Geographic representativeness comment	Required	Not repeatable	Free text (String)	Description of the data set's geographic representativeness and any geographic aggregation methods.	"US Region 4 (Center) includes US-AZ, US-CO, US-ID, US-KS, US-MT, US-ND, US-NE, US-NM, US-NV, US-OK, US-SD, US-TX, US-UT, US-WY."	If you are using a location than ISO 3166-2 (US states) to your data, provide the location name (e.g. HUCS codes, ANSI Codes, region names, GIS code number, and a description of the location system.

<p>Technology Description</p>	<p>Required</p>	<p>Not repeatable</p>	<p>Free text (String)</p>	<p>A short, general description of the process's technical scope. This description should inform users of the data's technical relevance. Include a list of processes/ activities (anthropogenic or natural) included in the dataset, including a description of any fate and transport modeling.</p>	<p>“This process produces corn grain, at harvest, at farm, 85%-91% moisture. The process is assumed to represent production in Illinois (US State). Yields and related inputs and outputs represent a single year of operation, in 1996. Residue burning; soil preparation; planting or sowing; irrigation; application, storage, and transport of fertilizers, manures, liming materials, secondary materials, and pesticides; and harvest. Fate and transport of applications are not included as described in Cooper, J.S., Kahn, E., Noon, M. (2012), LCA Digital Commons Unit Process Data: field crop production Version 1.</p>	
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Administrative Information

<u>Element</u>	<u>Required?</u>	<u>Repeatable?</u>	<u>Datatype</u>	<u>Definition</u>	<u>Example</u>	<u>Notes</u>
Intended application	Required	Not repeatable	Free text (String)	Describe the data set's intended application, including the context in which the data were developed and the objectives of the research. The intended application may differ due to project scope or system boundaries, data aggregation methods, and/or data gaps.	"These data were developed specifically for a life cycle greenhouse gas assessment of regional fluid milk production. Management practices were aggregated by region and the results of the study were intended to identify sources of emissions across the dairy industry rather than on specific farms."	
Data set owner	Required	Not repeatable	Reference to "Actor" data set representing "Data set owner"	Name of the person or entity that owns this data set. The data set owner is not necessarily the copyright holder, if the data set is copyrighted.	John Smith	See the Actor section for instructions on how to fill out the Data set owner field. In openLCA and the ILCD editor, you must modify the Actor (openLCA) or Contact (ILCD) record for the Data set owner field to be changed in the Process record.
Data generator	Required	Not repeatable	Reference to "Actor" data set representing "Data generator"	Name of the person or entity responsible for generating the dataset.	Jane Doe	See Notes field for Data set owner .

Data documentor	Optional	Not repeatable	Reference to “Actor” data set representing “Data documentor”	Name of the individual or entity that documented the data set. Documentation activities include entering information into an LCA modeling program or database.	Mary Smith	See Notes field for Data set owner .
Publication	Optional	Not repeatable	Reference to “Source” data set	Reference to an APA (American Psychological Association) formatted citation of a foundational publication that illustrates how the data were used.	(Thoma et al, 2012)	See the Source section for instructions on how to fill out the Publication field. In openLCA and the ILCD editor, you must edit Publication information in the Source record for it to appear in the Process record.
Access and use restrictions	Do not enter	Not repeatable	Free text (String)	A clear statement about how the data and metadata may be used.		USDA-NAL will prepopulate this field with a statement of usage terms and conditions.
Project	Optional	Not repeatable	Free text (String)	Information about the project in which the data were generated.	Data were prepared by the University of Washington Design for Environment Laboratory for the United States Department of Agriculture, National Agricultural Library under cooperative agreement number 58-8201-0-149.	Include the following information: <ul style="list-style-type: none"> - Project name - Funding institutions or organizations and <ul style="list-style-type: none"> - Grant or contract names and numbers

Creation date	Required	Not repeatable	Timestamp	The date and time when the dataset is submitted to the LCA Commons. (LCA Commons)	2013-12-31 09:33:29.0	<p>Encoded in ISO 8601 date/time format.</p> <p>This field will be automatically generated when the dataset is accepted to the LCA Commons.</p>
Copyright	Required	Not repeatable	Boolean (True/False)	A flag indicating whether or not the dataset is copyrighted. (LCA Commons)	N/A	<p>A checkbox for the Copyright field is available in openLCA.</p>

Modeling and validation

<u>Element</u>	<u>Required?</u>	<u>Repeatable?</u>	<u>Datatype</u>	<u>Definition</u>	<u>Example</u>	<u>Notes</u>
Process type	Required	Not repeatable	Enumeration (System process OR Unit process)	Indication of whether the data represent a unit or system process, where a system process is an LCI result.	Unit process	If you are creating your model in openLCA, you must choose either “System process” or “Unit process” in the “Process type” drop- down menu.
Data completeness	Required	Not repeatable	Free text (String)	<p>Include the three elements below:</p> <ul style="list-style-type: none"> - Treatment of missing intermediate flow data - Treatment of missing data to or from the environment <p>and</p> <ul style="list-style-type: none"> - Mass balance 	See fields below	

<p>Treatment of missing intermediate flow data</p>	<p>Required</p>	<p>Not repeatable</p>	<p>Free text (String)</p>	<p>List and describe methods for accounting missing data (e.g., cut off rules, use of service processes) and/or intended omissions. As applicable, for crop/biomass production include mention of missing data on:</p> <ul style="list-style-type: none"> a. Co-production b. Flows from the environment (occupied area, transformed area, water withdrawal, nutrients from air and soil (in crops, co-products, and above and belowground residues) c. Technosphere/ intermediate flows (field residue burning, residue management, soil preparation, planting or sowing, seed or feed use and storage, irrigation, fertilizer application, liming material application, secondary materials application, pesticide application, application materials storage, transport/ distribution, harvest) d. Flows to the environment (residue burning emissions, residue left on the field (above and below ground), water (in irrigation, with manure applications, in sewage sludge applied), substances applied in fertilizers, manures, secondary applications, and pesticides). As applicable, for equipment operation include mention of missing data on: <ul style="list-style-type: none"> a. Co-production b. Flows from the environment (water withdrawal, air used in combustion, other directly extracted resources) c. Co-production d. Flows from the environment (water withdrawal, air used in combustion, other directly extracted resources) Technosphere/ intermediate flows (energy use, product materials use, ancillary materials use, transport/ distribution, equipment construction and retirement, spare parts, facility use) e. Flows to the environment (operating emissions including unrecovered product and ancillary materials) 	<p>Missing data are represented as “service” processes, used in cases where the annual USDA Agricultural Resource Management Survey (ARMS) data are incomplete (such as when ARMS data has been omitted for privacy or specific ARMS variables do not represent 100% of the planted area).</p> <p>These service processes are intended to ensure that missing data are represented as such (values are not zero but instead are unknown) and that ultimately data representing the range of possibly applicable practices are developed.</p>	<p>Not available in openLCA, GaBi, or SimaPro. The contents of this field will be added to the Data completeness field in openLCA.</p>
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<p>Treatment of missing data to or from the environment</p>	<p>Required</p>	<p>Not repeatable</p>	<p>Free text (String)</p>	<p>List and describe methods for accounting missing data (e.g., cut off rules) and/or intended omissions (e.g., to say that only select emissions such as greenhouse gases are represented).</p>	<p>Missing flow data to or from the environment are represented as unspecified flows (sometimes abbreviated as unspec). Also, fate and transport considerations are intentionally not included in unit process data preparation.</p>	<p>Not available in openLCA, GaBi, or SimaPro. The contents of this field will be added to the Data completeness field in openLCA.</p>
<p>Mass balance</p>	<p>Required</p>	<p>Not repeatable</p>	<p>Decimal</p>	<p>Either:</p> <ul style="list-style-type: none"> a. Quantify and describe the mass imbalance (as the mass of outputs less that of inputs) <p>OR</p> <ul style="list-style-type: none"> b. Describe the mass balance as unknown 	<p>The mass imbalance for all exchanges is 0.00 kg.</p>	<p>See the Notes field for Treatment of missing intermediate flow data.</p>

<p>Data treatment</p>	<p>Required</p>	<p>Not repeatable</p>	<p>Free text (String)</p>	<p>Detailed description of the methods and assumptions used to transform primary and secondary data into flow quantities through recalculating, reformatting, aggregation, or proxy data. Also includes a description of data quality.</p>	<p>Data represent an aggregation of processes applied in Illinois in 1996. Data development is demonstrated by parameterization (presents all raw data and calculations).</p>	
<p>Sampling procedure</p>	<p>Required</p>	<p>Not repeatable</p>	<p>Free text (String)</p>	<p>Detailed description of how boundary conditions were defined, how data were collected, and how uncertainty is estimated.</p>	<p>A delete-a-group jackknife is used by the USDA to estimate the ARMS sample means because the population means are unknown. Differences between a sample and population mean result from non-sampling and sampling errors. ARMS RSE data are based on a 15 sample delete-a-group jackknife. Because of this relatively small sample sizes, a Student's t distribution is used in this dataset as an appropriate representation of the ARMS data probability density functions. Other representations of uncertainty are described in Cooper, J.S., Kahn, E., Noon, M. (2012) "LCA Digital Commons Unit Process Data: field crop production Version 1."</p>	

Data collection period	Required	Not repeatable	Free text (String)	Time period in which the data were collected.	"Data were collected throughout 2009."	
Reviewer	Required	Not repeatable	Reference to "Source" data set	Name of the individual or entity who reviewed the dataset.	USDA National Institute of Food and Agriculture (NIFA) Peer-Review Panel	See the Name field of the Actor section for instructions on how to fill out the Reviewer field. In openLCA and the ILCD editor, you must adjust the corresponding Actor record to change the Reviewer field.
Data set other evaluation	Required	Not repeatable	Free text (String)	Review information pertaining to the dataset	Rob Anex, (Review Panel Chair, Biological Systems Engineering, University of Wisconsin Madison), Mike Edgerton (Monsanto), Jane Johnson (Agricultural Research Service, USDA), Tony Vyn (Agronomy Department, Purdue University), Marty Matlock (Department of Biological and Agricultural Engineering, University of Arkansas).	

<p>Sources</p>	<p>Required</p>	<p>Repeatable</p>	<p>Free text (String) – APA Formatted citation</p>	<p>The primary and secondary resources used to compile the data.</p>	<p>Cooper, J.S., Kahn, E., Noon, M. (2012). LCA Digital Commons Unit Process Data: field crop production Version 1. Prepared for the US Department of Agriculture, National Agricultural Library. Retrieved from https://www.lcacommons.gov/</p>	<p>Please provide an APA-formatted citation for all sources. The APA format is as follows:</p> <p>First author (last name, initials only for first & middle names), additional authors (last name, initials only for first & middle names), title, publication name, publisher, place of publication, government agency, volume and issue, number, year, page numbers , DOI, URL.</p>
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Parameters

NOTE: Parameters are NOT REQUIRED for datasets submitted to the LCA Commons, but if parameters are submitted, the following elements must be included:

<u>Element</u>	<u>Required/Optional</u>	<u>Repeatable?</u>	<u>Data type</u>	<u>Definition</u>	<u>Example</u>	<u>Notes</u>
Name	Required if applicable	Not repeatable	Free text (String)	Parameter name	p001	
Formula	Required if applicable	Not repeatable	Integer/Decimal	Parameter formula	0.404686	
Numeric value	Required if applicable	Not repeatable	Decimal	Parameter numeric value	0.404686	
Description	Required if applicable	Not repeatable	Free text (String)	Brief description of how and why the parameter was developed.	Conversion factor for ha per acre	

Flow Data Set (Exchanges)

<u>Element</u>	<u>Required?</u>	<u>Repeatable?</u>	<u>Datatype</u>	<u>Definition</u>	<u>Example</u>	<u>Notes</u>
Name	Required	Not repeatable	Free text (String)	General descriptive and specifying name of the flow.	<p>Technosphere flow: soybeans, at harvest, production mix at farm, 85%-92% moisture</p> <p>Elementaryflow: 1,1,2,2-Tetrachloroethane</p>	<p>Product/technosphere flow names must include the following 4 components:</p> <ul style="list-style-type: none"> - Base name - Treatment, standards, routes - Mix and location types - Quantitative flow properties <p>The quantitative reference flow name must be identical to the name of the Process it is connected to.</p>
Description	Optional	Not repeatable	Free text (String)	Descriptive information about the flow	Technosphere flow developed by USDA	

Category	Required (for Technosphere or Product flows)	Not repeatable	Enumeration (For Technosphere/Product Flows – ISIC Codes. For elementary flows – EcoSpold v1 categories)	For technosphere flows, use the categorization guidance for unit processes (see General information section). For elementary flows, use the EcoSpold (v1) categories for flows to and from the environment	air, low population density (Elementary flow) Agriculture, forestry and fishing – ISIC 0112: Growing of rice (Technosphere flow)	
Version (“Flow” data set)	Do not enter	Not repeatable	Version (XX.XX.XXX)	The data set version number. The first two digits refer to major updates, the second two digits refer to minor revisions and error corrections, and the final three digits are used for automatic and internal version counting during data set development. (ILCD)	01.00.000	Unless discussed with submitters in advance, the data set version number will be generated automatically by openLCA
Last change (“Flow” data set)	Required	Not repeatable	Timestamp	The date and time when the dataset was last saved. (LCA Commons)	2014-01-22 13:41:44.0	Encoded in ISO 8601 date/time format. If you are creating data in openLCA, this field will be automatically generated.
CAS Number	Required for Elementary flows, Optional for Technosphere or Product flows	Not repeatable	Free text (String)	Chemical Abstract Systems number of the substance.	007785-26-4	Used only for elementary flows. The CAS Number in this entry represents “(1s) - (-)-alpha-pinene”.

Formula	Optional	Not repeatable	Free text (String)	Chemical formula of the substance.	C10H16	Used only for elementary flows. The formula in this entry represents "(1s)-(-)-alpha-pinene".
Location Description	Optional	Not repeatable	Free text (String)	If the data represent a U.S. state, use ISO 3166-2 code indicating the data set's geographic location (US state).	US-MD	If the data represent a custom location, describe this location with free text.

Actor Data Set

<u>Element</u>	<u>Required/Optional</u>	<u>Repeatable?</u>	<u>Datatype</u>	<u>Definition</u>	<u>Example</u>	<u>Notes</u>
Name	Required	Not repeatable	Free text (String)	Full name of the Actor associated with the dataset.	Jane Smith Jane T. Smith	Provide the actor's first and last names in the following order: [First name] [Last name] If you wish to include the Actor's middle initial or middle name, record them in the following order: [First name] [Middle initial OR Middle Name] [Last name]
Description	Optional	Not repeatable	Free text (String)	Description of the Actor's affiliations and position.	LCA Researcher Knowledge Services Division National Agricultural Library	Provide the Actor's: - Title - Department name (if applicable) AND - Organization name (if applicable)

Version ("Actor" data set)	Do not enter	Not repeatable	Version (XX.XX.XXX)	The data set version number. The first two digits refer to major updates, the second two digits refer to minor revisions and error corrections, and the final three digits are used for automatic and internal version counting during data set development.	01.00.000	Unless discussed with submitters in advance, the data set version number will be generated automatically by openLCA
Last change ("Actor" data set)	Required	Not repeatable	Timestamp	The date and time when the dataset was last saved. (LCA Commons)	2014-01-22 13:41:44.0	Encoded in ISO 8601 date/time format. If you are creating data in openLCA, this field will be automatically generated.
Address	Optional	Not repeatable	Free text (String)	The Actor's street or mailing address.	10301 Baltimore Avenue	In the following order, provide the Actor's - street number - street name, and - suite or apartment number (if applicable)
City	Required	Not repeatable	Free text (String)	The city in which the Actor resides or works.	Beltsville	City is included in the "Address" field

Country	Required	Not repeatable	Free text (String)	The country in which the Actor resides or works.	United States	Use the applicable ISO 3166 country code to indicate the country's name.
e-mail	Required	Not repeatable	Email	The Actor's email address.	janesmith@email.com	
Telefax	Optional	Not repeatable	Free text (String)	The Actor's fax number.	123 - 456 - 7890	International phone numbers are acceptable. If a fax number is available, please list the number in the following format, starting with the 3 digit area code: International telefax numbers are also acceptable, provided the appropriate country code is provided.
Telephone	Required	Not repeatable	Free text (String)	The Actor's telephone number.	098 - 765 - 4321	List the actor's telephone number in the following format, beginning with the 3-digit area code: XXX - XXX - XXXX If the phone number is from outside the United States, please provide the applicable country code.
Website	Required, if applicable	Not repeatable	URL	The Actor's website.	http://www.usda.gov/	Please provide the website's complete URL, including the HTTP prefix (http://)

Zip code	Optional	Not repeatable	Integer (5 digits)	The 5-digit zip code of the Actor's street or mailing address.	20705	Provide the 5-digit zip code that corresponds to the Actor's street address.
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Source Data Set

<u>Element</u>	<u>Required?</u>	<u>Repeatable?</u>	<u>Datatype</u>	<u>Definition</u>	<u>Example</u>	<u>Notes</u>
Name	Required	Not repeatable	Free text (String)	Name of the publication or resource used to compile the dataset.	Commentary on issues in data quality analysis in life cycle assessment	
Description	Optional	Not repeatable	Free text (String)	Free text for additional description of the source. In case of use of published data it may contain a brief summary of the publication and the kind of medium used (e.g. CD-ROM, hard copy).	Data dictionary for LCA study	

Version (“Source” data set)	Do not enter	Not repeatable	Version (XX.XX.XXX)	The data set version number. The first two digits refer to major updates, the second two digits refer to minor revisions and error corrections, and the final three digits are used for automatic and internal version counting during data set development.	01.00.000	Unless discussed with submitters in advance, the data set version number will be generated automatically by openLCA
Last change (“Source” data set)	Required	Not repeatable	Timestamp	The date and time when the dataset was last saved. (LCA Commons)	2014-01-22 13:41:44.0	Encoded in ISO 8601 date/time format. If you are creating data in openLCA, this field will be automatically generated.
Doi	Required If applicable	No	URL	Digital object identifier of the resource.	http://dx.doi.org/10.1007/s11367-011-0371-x	Attach the following prefix to the beginning of the Doi so that it is a resolvable URL: http://dx.doi.org/
Text reference	Required	No	Free text (String)	APA-formatted text citation.	(Ellis et al, 2007)	
Year	Required	No	Integer (4 digits)	Year in which the resource was created.	2014	Encode the publication year in the following format: “YYYY”

Peer Review

[USDA-NAL](#) administers a peer review of submitted datasets to evaluate metadata and data quality. The peer review will not necessarily judge the validity of modeling assumptions and results, but rather document complete metadata that ensure transparency. USDA-NAL's objective is to provide users with enough information to select and use datasets.

During the editorial review process, each submission will be distributed to 1-3 external reviewers. Reviewers will return feedback within 30 days and the editorial staff will work with submitters to address comments and any remaining formatting issues. Upon acceptance to the LCA Commons, USDA-NAL will assign each unit process a [Digital Object Identifier \(DOI\)](#) to ensure persistent access and citability.

The peer review process is not anonymous; it is designed to produce constructive feedback for practitioners and stimulate dialogue to improve data quality and move the agricultural LCA domain forward.

Appendices A-C: Data Submission and Use Agreements

Appendix A: Data Use Disclaimer Agreement (“Agreement”)

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Appendix B: Data Contributor's Content License Agreement ("Agreement")

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Appendix C: Creative Commons Legal Code

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Official translations of this legal tool are available

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